SURVEY OF THE DRIVING NEEDS OF LICENSED DISABLED DRIVERS IN ONTARIO

Executive Summary

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Beverley O'Connell of the Human and Social Factors Office conducted the literature search, prepared the bibliography, assisted in coding the questionnaires and provided general assistance to this project.

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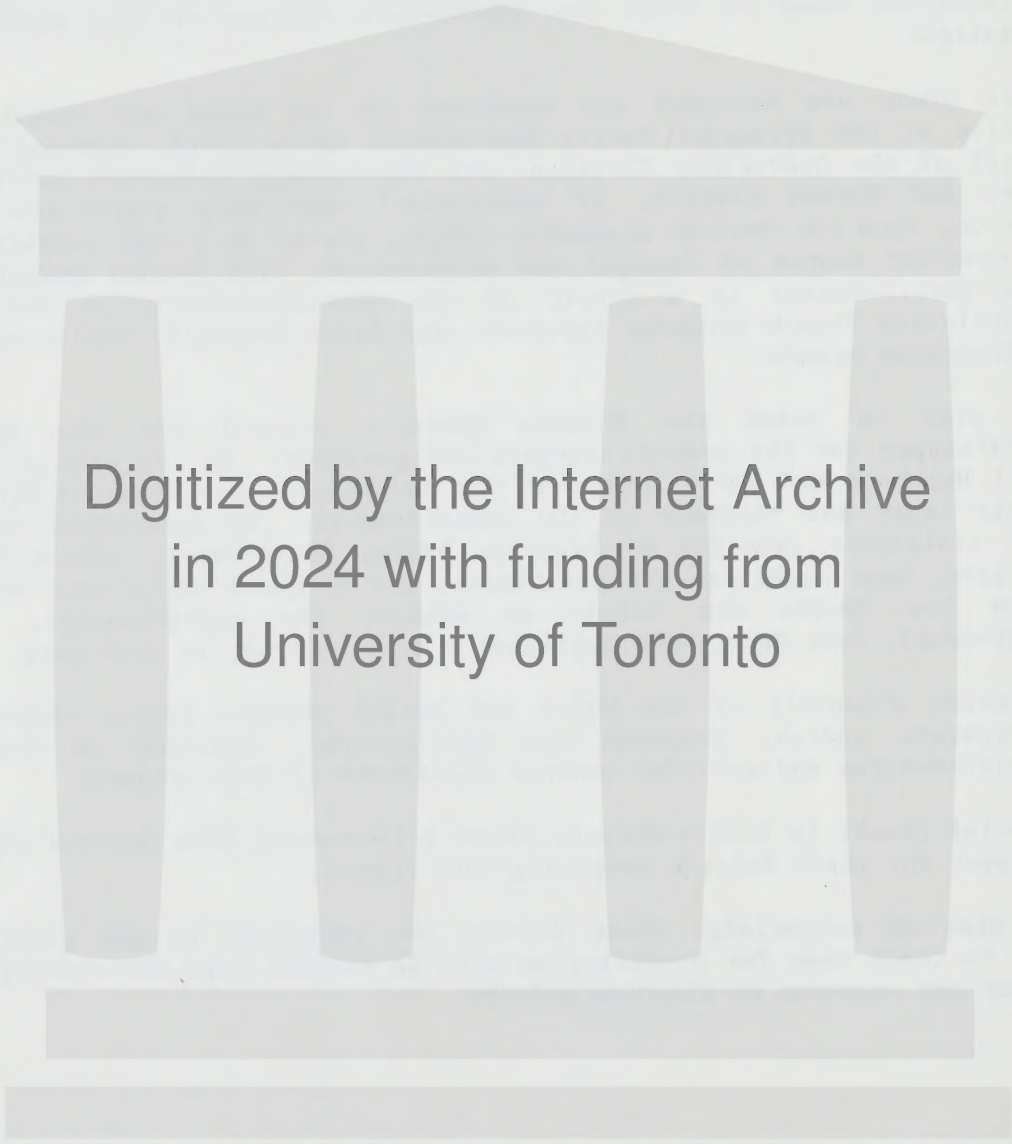
We wish to acknowledge those drivers who responded to the questionnaire and to thank them for providing us with an insight into the driving-related needs and concerns of disabled drivers.



EXECUTIVE SUMMARY

OVERVIEW

The purpose of this study was to survey licensed drivers in Ontario who require special driving equipment in order to gain an understanding of their driving-related needs as well as to identify any problems or issues facing the physically disabled driver with respect to vehicle conversions, adaptive driving aids and vehicle design.

A mail survey was conducted in February/March 1986 of all drivers in Ontario who require hand controls (1477) or assorted equipment (64). Within the assorted equipment group are those drivers who require a variety of adaptive driving aids other than hand controls, such as steering spinners, left-side gas pedals and brake extensions. The results of the study are based on the responses of 670 licensed drivers in the hand controls group and 26 drivers in the assorted equipment group, a response rate of 51% and 46%, respectively.

In addition, the same questionnaire was used with a pilot sample of 130 drivers who require automatic transmission and 100 drivers who require outside rear view mirrors to ascertain whether they have special driving needs as well. Pilot test results, based on response rates of 26% and 18%, respectively, are reported separately in Appendix B. The needs expressed by these drivers, for the most part, are not similar to those expressed by drivers who require hand controls or assorted equipment.

The survey focuses on the self-drive option and was designed to obtain a broad perspective on the driving-related needs of disabled drivers. Questions sought general information on demographic, lifestyle and travel patterns and specific information on physical disabilities, and vehicle design, conversions and driving aids. The survey explored level of satisfaction with various aspects related to driving as well as likely interest in a number of self-drive options, including future developments. The results are based on the experiences and views of drivers who are currently licensed to drive with special equipment, and are presented descriptively in terms of the frequency distribution of responses.

In general, the results indicate that the self-drive option is an important consideration to the drivers who are currently licensed to drive with special equipment. The mobility needs of these drivers are similar in some respects to those of the general driving population. On the other hand, these drivers expressed needs that relate to the fact that special equipment and/or vehicle modifications are required to accommodate their specific physical disabilities. The concerns they report in the survey, together with their ratings of the importance of various design considerations, provide clues for developing and improving vehicle options and design. Their expression of likely interest in a number of potential options suggests areas of potential market demand that could be explored. The results also suggest that there is a need for more information related to the many aspects of the self-drive option.

While this survey provides the views on the self-drive option of drivers currently licensed to drive with special equipment, it may also be relevant to the needs of disabled persons who want to drive and could with the appropriate equipment, and to elderly and other drivers who may benefit from the use of special equipment.

HIGHLIGHTS FROM THE RESULTS OF DRIVERS USING HAND CONTROLS

Profile of Driver

- Hand controls are required by those drivers who are unable to operate the brake or gas pedal in the usual fashion due to physical limitations in the use of their legs. The majority of drivers surveyed (91%) report that they have restricted use of both legs primarily due to paraplegia (50%), polio (20%) and quadriplegia (11%). Most (84%) require the use of a wheelchair.

- Approximately 74% of the disabled drivers who responded to this survey are males compared to the 56% of males in the general driving population of Ontario. Another observation is that there is a larger proportion of respondents between 35 and 64 years of age and a smaller proportion in the under 25 age group.

- About 40% of these drivers work full-time and 8% work part-time. Of those who work, 91% are employed outside the home.

The report also provides responses to other questions related to demographic characteristics such as region and location of residence, living arrangement, education and annual household income.

Travel and Transportation Needs

- The majority of respondents own their vehicle and over half share it with others which suggests that vehicles and driving aids need to be designed to facilitate use by both disabled and able-bodied drivers.

- While licensed disabled drivers reported that they choose the self-drive option for the majority of monthly trips, they do use other means of transportation, although on a limited basis, such as special transit and taxi, as well as being vehicle passengers.

- When asked whether driving their own vehicle is necessary, about 70% of respondents indicated that they prefer to drive while 18% indicated that they have no other alternative. About 7% have to drive for their job.

- Strong dissatisfaction was expressed with the enforcement of parking provisions for handicapped drivers; 27% are dissatisfied and 54% are very dissatisfied.

- Approximately 64% of the respondents are satisfied with licensing requirements and procedures and 17% are very satisfied. About 11% expressed some dissatisfaction and 8% did not have an opinion.

- The availability of vehicle insurance is satisfactory to 54% and very satisfactory to 22%; about 20% expressed dissatisfaction.

- With respect to the availability and quality of special driver training and professional assessment of driving abilities, the majority of respondents (53-62%) either had no opinion or replied "not applicable" suggesting that these drivers never received such services. Of those expressing an opinion, more are satisfied with the availability and quality of driver training and professional assessment (27-35%); however, a number expressed dissatisfaction with the quality of these services (11-12%) and especially with their availability (18-19%).

- About 65% of respondents reported satisfaction with provincial licence plates displaying the international symbol of access and 23% indicated that they are not satisfied. The two main reasons for dissatisfaction are that these plates are too easy to obtain and they label the driver as being disabled, thus endangering personal safety.

- About 48% of drivers reported that they are satisfied with special parking permits and 26% indicated that they are dissatisfied. The main reasons for dissatisfaction include: lack of universality, not available in all municipalities, lack of awareness and police still ticketing.

The report provides responses to other questions such as driving experience and driving exposure (e.g. annual mileage).

Description of Current Vehicle

- Most of the respondents in the hand controls group (79%) report that they drive standard production cars. Many of these cars are two-door models (64%). Others drive regular vans (16%), trucks (3%) or mini vans (2%).

- Approximately an equal number of respondents drive a vehicle which is less than 6 years old as drive a vehicle which is over 6 years old. According to Statistics Canada estimates, the average age of vehicles currently driven by the general driving population is 5.8 years for personal-use passenger cars and 6.3 years for personal-use vans and light trucks (Household Surveys Division, personal communication, September 23, 1986).

- Many of the vehicles driven have split bench or bench style front seats (54%) and are equipped with an average of seven factory options.

- The average price paid for a vehicle was approximately $9,785 with reported prices ranging from $100 to $36,000. The largest proportion of respondents (33%) paid between $5,000 and $9,999 for their vehicle. The majority of respondents (75%) did not receive any mobility allowance or financial assistance for the purchase and/or conversion of their vehicle. Of the 146 respondents who reported that they did receive some financial aid, the majority (69%) received

assistance from a government agency. Some made specific reference to the provincial sales tax rebate of 7% of the price paid for a vehicle.

- The average price paid for vehicle insurance in 1985 by drivers requiring hand controls was approximately $579, although reported rates ranged from $170 to $4,400. Based on insurance figures, the average price paid for insurance in 1985 by the general Ontario driving population is estimated to be approximately $461.

- In response to an open-ended question, a small percentage (15%) identified design features that fail to meet their driving needs such as lack of room behind the driver's seat often resulting in torn upholstery from stowing a wheelchair in the back seat (15); foot-operated controls (e.g. dimmer switch) (10); and poor location of secondary controls such as windshield wipers, and headlights (10).

Responses to questions concerning vehicle make and year, type of van side doors and specific factory options are also addressed in the report.

Vehicle Conversions

- A total of 55 respondents (9%) reported that their vehicles have been structurally converted in one or more of the following ways: raised roof (66%), power pan (15%), wheelchair channels (15%), raised side door (11%) and dropped floor (4%).

- The majority of vehicles (93%) were converted in Ontario, over one-third in the Toronto area. Another 8% were converted in the United States. While most (76%) were converted by companies specializing in conversions, others were converted by dealerships (15%), licensed auto mechanics (8%), and personal contacts (6%).

- Most vehicles (79%) were new when they were structurally converted.

- The average price paid to have the vehicle converted was approximately $7,000 with prices ranging from $300 to $25,000. Twenty-seven drivers (50%) received some financial assistance, the majority (78%) from a government source such as the Workers' Compensation Board, Department of Veteran Affairs and the provincial sales tax rebate on the purchase of a vehicle.

- Respondents reported problems with the following: raised roof (5), power pan (3), wheel channels (3) and raised side door (2).

- When asked for their perception of the safety of the conversion, most respondents (92%) expressed satisfaction.

- In decreasing order of satisfaction, the percentage of respondents who expressed satisfaction as compared to dissatisfaction is:

  - quality of conversion (79% versus 20%);
  - service/maintenance (73% versus 23%);
  - time to arrange conversion (54% versus 40%); and
  - time required to complete structural conversion (51% versus 41%).

- Strong dissatisfaction was expressed with the availability of contractors (61%), the availability of information on vehicle conversions (60%) and the cost of the structural conversion (59%).

Adaptive Driving Aids

- The adaptive driving aids used include: acceleration/braking aids (608) such as hand controls and parking brake extensions; vision aids (344) such as full range rear view mirror; safety aids (234) such as wheelchair restraints; steering aids (205) such as steering spinners; control lever aids (200) such as remote dimmer switch; and entry/exit aids (166) such as automatic lifts and doors.

- The driving aids for which problems were most frequently noted include: hand controls (68); automatic lifts (30); steering spinners (23); automatic doors (22); safety torso restraints/chest harness (21); and right side-mounted convex rear view mirrors (14). In many cases, respondents reported that problems are due to equipment failure.

- The average price paid by drivers in the hand controls group for adaptive driving aids was $985 with reported prices ranging from $5 to $20,000. The largest percentage (46%) paid between $251 and $500.

- The majority (76%) purchased their aids in Ontario, the largest proportion (39%) in Toronto; however, a number (13%) purchased aids from other provinces, primarily British Columbia (10%). Another 12% purchased driving aids from the United States.

- Adaptive driving aids were installed by vendors (37%), licensed auto mechanics (31%), personal contacts (20%), equipment manufacturers (8%) and drivers themselves (10%).

- When asked for their level of satisfaction, respondents reported that they are highly satisfied with the safety of adaptive driving aids (93%) and the quality of installation (90%).

- In decreasing order of satisfaction, the percentage of respondents who are satisfied as compared to dissatisfied is:

  - service/maintenance (75% versus 15%);
  - time taken for installation (74% versus 16%); and
  - time required to arrange installation (67% versus 19%).

- Respondents are highly dissatisfied with the availability of information on adaptive driving aids (50%), the cost (49%) and the number of available qualified installers (47%).

- Approximately 109 respondents (18%) reported that they are lacking special equipment that could help with their driving because the cost is too high, naming such equipment as: factory options (30%), wheelchair lift (15%), mobile telephone (8%) and hand controls (6%).

The report provides further information on respondents' views about disassembling and reusing adaptive driving aids; sources of information on conversions and driving aids; and suggestions for changes or improvements in vehicle design, structural conversions and adaptive driving aids.

Future Vehicular Needs

- About 44% of respondents indicated that they would be in the market to buy a new vehicle within the next two years and provided a range of prices that they might be willing to pay for their next vehicle.

- When provided with a list of 8 vehicle design features, respondents indicated the following to be the most important when choosing another vehicle: ease of entry/exit (73%), followed by size of vehicle (42%), head and leg room (36%), wide doors (32%), seats (32%), appearance (30%), accessible storage space (22%) and height of vehicle (15%).

- Of the 541 respondents who use wheelchairs, 29% reported that they might be willing to pay an additional amount to have a car which can be driven from a wheelchair and to which level access is possible without the use of a lift.

- Approximately 33% of the 541 respondents who use wheelchairs, reported that they might be willing to pay an additional amount for a van which can be driven from a wheelchair and to which level access is possible without the use of a lift or the need for a raised roof.

- Slightly over half of the total respondents (51%) indicated that they would prefer an intermediate or large size car for their next vehicle while others expressed a preference for vehicles such as a regular van (20%), a mini van (13%), compact car (11%) and subcompact car (3%).

- A strong interest was expressed by 70% of respondents in owning a vehicle that would meet their driving needs and would not be recognized as a vehicle for disabled drivers.

- While 61% of respondents reported that they are not interested in the potential option of an electric car for local urban use, 23% expressed interest and 10% indicated that they are very interested.

- Seventy-eight percent of respondents indicated that they are not interested in the option of shared ownership of a vehicle while 16% expressed an interest.

- Approximately 51% of respondents reported that they are not interested in renting or leasing a vehicle adapted to meet their needs, 24% are interested and 19% are very interested.

The report provides a summary of reported preferences for a number of vehicle features including number of doors, type of van side doors, type of driver's seat, factory options, adaptive driving aids and vehicle conversions.

Other Comments

The report includes suggestions for improvement, provided by the respondents in response to an open-ended question at the end of the questionnaire.

HIGHLIGHTS FROM THE RESULTS OF DRIVERS REQUIRING ASSORTED EQUIPMENT

Responses to the survey were received from 26 respondents who require assorted driving equipment, a limited number due to the small population (64) of drivers identified with this licence restriction. The results suggest that the travel and transportation needs of respondents who require assorted equipment and those who require hand controls are similar as is their assessment of driving-related needs. Several common issues were identified including issues related to parking provisions, problems with adaptive driving aids, lack of qualified installers, and lack of information on adaptive driving aids.

Differences were apparent in the selection of a vehicle and associated design features, and in the range of adaptive driving aids used. These differences are likely attributable to differences in the nature and extent of the disabilities affecting these drivers. Only those results that indicate differences are highlighted below.

Profile of Driver

- The main disabilities reported by the 26 respondents are amputation (8), shortness of body or limbs (8) and back/spine impairment (5). Most of the respondents (20) have restricted use of their lower body; however, for many (15) only one leg is affected. Respondents reported using assistive devices such as canes, leg/foot brace, leg or foot prosthesis, crutches and special shoes; no one reported using a wheelchair. Upper body limitations, due mainly to paralysis and amputation, were reported by 14 respondents.

Description of Current Vehicle

- The cars driven by respondents are mainly four-door models (17) with bucket seats (14).

- Of the 12 respondents who identified vehicle design features which fail to meet their driving needs, 6 noted the poor location of secondary controls.

Vehicle Conversions

- None of the respondents reported structural conversions.

Adaptive Driving Aids

- Eighteen of the 26 respondents use acceleration/braking aids, 13 use steering aids, 7 use vision aids, 6 use safety aids, 5 use control lever aids and 3 use entry/exit aids.

- The average price paid for adaptive driving aids by drivers in the assorted equipment group was approximately $105, with prices ranging from $15 to $500.

Future Vehicular Needs

- An intermediate size car was chosen as the preferred size by 9 respondents, followed by a compact car (8).

- From a list of 8 design features, respondents selected the following as being the most important: size of vehicle (15); ease of entry/exit (14); seats (11); head and leg room (9); and appearance (7).

PILOT STUDY

A pilot study was conducted using the same questionnaire that was sent to drivers requiring hand controls and assorted equipment. Questionnaires were sent to a sample of 130 drivers requiring automatic transmission and 100 drivers requiring outside rear view mirrors in order to determine whether these drivers have special driving needs.

The response rate was 26% for the automatic transmission sample and 18% for the outside rear view mirrors sample. The lower response rates may be due to the fact that the questionnaire covered a broad range of disabilities and special equipment which many did not find relevant to them. A different questionnaire would need to be developed to carry out a full study of these groups. However, some information was obtained in this pilot study as a number of respondents reported using driving aids in addition to the equipment required by their licence restriction.

Automatic Transmission Sample

- Twenty-seven respondents reported having one or more of the following disabilities: amputation (14), polio (7), stiff joints (6), arthritis (5), shortness of body or limbs (2), heart condition (1), paraplegia (1), and a back/spine impairment (1). The adaptive driving aids reported to be used by these drivers include: left-foot gas pedal, hand controls, left convex rear view mirror, right convex rear view mirror, full range rear view mirror, dual mirrors, torso restraint/chest harness, two-way radio, fire extinguisher, remote dimmer switch, remote controls and steering column adjuster.

Outside Rear View Mirror Sample

- Thirteen of the 15 respondents reported being hard of hearing while two respondents reported having arthritis and/or a back impairment. Adaptive driving aids reported to be used include: left convex rear view mirror, right convex rear view mirror, full range rear view mirror, dual mirrors, right side turn signal, remote controls, remote dimmer switch and torso restraint/chest harness.

Implications

- There are currently 2,126 drivers in Ontario who require automatic transmission and 727 who require outside rear-view mirrors. In order to obtain a better understanding of the needs of these two groups, especially the automatic transmission group who require a range of equipment for a number of disabilities, a questionnaire designed to address their needs would be required.

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* Based on this work, The Transportation Development Centre has recently published a consumer or buyer's guide entitled "Vehicles and Adaptive Aids for Elderly and Diabled Drivers" (Cat. No. T48-25-1986E; ISBN:0-660-11937-4) which is available with a charge from the Canadian Government Publishing Centre, Ottawa, Canada K1A 0S9 (telephone: (819) 997-2560).

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